MARSHALL STAR

Marshall Space Flight Center — *Aug. 9, 2001*

Inside the Star

Discovery set to launch next Space Station assembly phase Thursday

NASA release

Space Shuttle Discovery will launch a new crew and a host of supplies and scientific racks and experiments to the International Space Station Thursday, beginning a new phase of Station assembly that will expand the complex as research work grows.

Discovery's launch on the 12-day STS-105 mission has been set for 4:38 p.m. CDT Thursday.

"This flight is representative of many shuttle missions to come as station assembly and operations enter a new phase," Space Shuttle Program Manager Ron Dittemore said. "Although extremely complex and challenging assembly flights will continue, they'll be interspersed with missions dedicated to changing Station crews, experiments and supplies. Discovery is set to launch only about two weeks after Atlantis' return from the Station, and the team has done a tremendous job."

Astronaut Scott Horowitz (Col. USAF) will command Discovery. Frederick "Rick" Sturckow (Major, USMC) will be the Space Shuttle's pilot. The Shuttle crew also includes Patrick Forrester (Lt. Col., USA) and Dr. Daniel Barry, mission specialists who will perform two spacewalks during the mission to install logistical equipment and prepare for future Station assembly.

Launching to the Station aboard Discovery will be the Expedition Three crew, led by American Commander Frank Culbertson, and joined by Russian crewmates Vladimir Dezhurov, mission pilot, and flight engineer Mikhail Tyurin.

The Station's second resident crew, directed by Russian Commander Yury Usachev, with American astronauts Jim Voss and Susan Helms, will return to Earth aboard Discovery, ending more than five months in orbit.

Discovery is expected to land about 12:17 p.m. CDT Aug. 21 at Kennedy Space Center, Fla.

Sid Saucier, Marshall's Associate Director, dies

Marshall Center's Associate Director Sidney P. Saucier III, 65, died Monday. Visitation will be 5-8 p.m. Thursday at Laughlin Funeral Home on Bob Wallace Avenue. Funeral services will be at 2 p.m. Friday at Holy Spirit Catholic Church on Airport Road.

To honor Saucier, who had been Marshall's associate director since 1997, the U.S. flag at the Marshall Center will be flown at half-staff through Monday.

Among his many accomplishments, Saucier was instrumental in developing highly complex propulsion rocket stages capable of reaching planetary orbit, as well as advanced propulsion technologies to reduce the cost of space transportation.

"Sid was a very important part of our family here at Marshall," said Center Director Art Stephenson. "His great courage and commitment inspired all of us. His leadership contributed significantly to the success of NASA and our nation's space program. We will miss him."

Saucier joined Marshall in 1962 as a propulsion and power engineer, and has held engineering and technical management positions of increasing responsibility.

He was project engineer for the RL-10 hydrogen/oxygen engine in the Center's former Propulsion and Vehicle Engineering Laboratory. He later transferred to Marshall's Program Development Directorate, where he had overall responsibility for engineering

Saucier

*See **Saucier** on page 7*

Marshall plays a significant role in building of Space Station

Director's Corner

With the recent landing of Space Shuttle Atlantis, the International Space Station development effort completed the second of three designated phases. ISS Phase II consisted of the successful assembly of U.S. and Russian components, and the installation of the U.S. Airlock.

I want you to know that I am extremely proud to say that the Marshall team, consisting of civil servants and contractor partners, was instrumental in this giant step of sustaining an international research presence in space.

Stephenson

Our team participated in the design, fabrication, integration and testing of all of the U.S. modules and racks, including system and control software, that are now orbiting: Unity — the Node; Destiny — the U.S. Lab; and Quest — the Airlock. We were instrumental in the design, fabrication and acceptance of the three Multi-Purpose Logistic Modules — Leonardo, Raffaello, and Donatello — that were built by the Italian Space Agency (ASI). We also designed, qualified and assembled the common berthing mechanism (CBM) and the common hatches. As well, we were responsible for the design, development, fabrication and integration of the Expediting the Process of Experiments to Space Station (EXPRESS) racks that are in Destiny.

Our outstanding team provided structural, dynamic and thermal testing of practically every element of the ISS. This testing occurred not only on all of the modules, but also on the trusses. We kept the crew safe by performing standard material tests, such as flammability and toxicity. We also performed non-standard testing for atomic oxygen, UV and particulate radiation, and plasma interactions. We designed and built special test equipment and tooling to support these tests. Electromagnetic compatibility and interference testing and analyses were performed for most of the elements, as well.

We provided a multitude of assessments, including: electrical power usage, mass properties, crew compatibility, meteoroid and orbital debris survivability, and solar activity. Simulations for the CBM operations have provided numerous crews with valuable opportunities to push the CBM to its limits. Configuration and data management systems enabled the successful development of hardware.

The Marshall team was responsible for the development and integration of the unpressurized logistic carrier missions that delivered Pressurized Mating Adapter 3 and the Space Station Remote Manipulator System. We also provided a portable crew fan, a cabin atmosphere sampling adapter, a hand-held temperature and air flow velocity measuring device, and the Flight Releasable Attachment Mechanism.

Our efforts don't stop with the delivery of the hardware to orbit. The Huntsville Operations Support Center's ISS Payload Operations Center with its core infrastructure of Information Technology and Communication Systems has been supporting payload operations 24x7, since February 2001. More than 15,000 commands have been sent from the POC to payloads and their support systems. We even have the capability to send commands by remote payload developers. We have a dedicated team that performs hardware moves of these oversized elements. They are supported by Missile Command, meteorological and local road crews. High Definition Television coverage has been provided, too.

Our team also contributed by using this truly world-class research facility. We sponsored 10 payloads that have flown during the International Space Station Phase II period. Scientific and commercial investigations and experiments were conducted in the disciplines of materials, biotechnology, fluid physics and microgravity environmental characteristics. These payloads helped initiate the research capability of the ISS and provided valuable information on ISS research accommodations, payload operations and the ISS environment.

We should all take pride in this great accomplishment. It is not just a milestone; it is a significant historical event. The J-Track Web site, accessible from the Marshall Center Newsroom — http://www1.msfc.nasa.gov/NEWSROOM/# — shows where the Station is and when it will be visible to us. Point out the Station to family and friends as it passes overhead, and tell them how it is one of the most ambitious projects ever undertaken by man … then tell them how proud you are to be a part of the Marshall team in Huntsville that helped make it a reality.

— Art Stephenson,
Marshall Center Director

Photo by Terry Leibold, NASA/Marshall Space Flight Center

The Government and Community Relations Department at Marshall shows the school supplies collected. Pictured from left are Judi Hollingsworth, Rosa Kilpatrick, Shar Hendrick, Marcia Cobun, and Cassandra Pitts.

Helping children go back to school

Marshall Center employees and contractors recently contributed more than $1,500 dollars in school supplies to needy children within 48 hours of receiving a notice to assist.

The Government and Community Relations Department coordinated the effort with assistance from other Marshall organizations. Thanks to the Marshall family for its unselfish donations toward helping those less fortunate.

The items were donated to Christmas Charities for distribution to area school children.

Unfortunately, the Christmas Charities building and its contents were lost to a fire on Aug. 4. The agency is in need of school supplies and clothing for school-age children. If you want to contribute, deliver the items to the former location on Cook Avenue, across from the Madison County Farmer's Market.

Marshall hosting minority- and woman-owned business technology transfer briefing Tuesday

by Jonathan Baggs

The Marshall Center's Technology Transfer Department is hosting a briefing on technology transfer opportunities for Alabama-based minority- and women-owned businesses at the Oakwood College Business & Technology Complex on Tuesday.

The daylong event will include briefings on available technologies and contract opportunities, one-on-one meetings with Marshall representatives, exhibits from Alabama economic development organizations, and a luncheon keynote speaker.

Karen Stanley, vice president of finance for Stanley Construction Co. of Huntsville will deliver the keynote address. A member of several Huntsville civic boards and organizations, she is a director of the Huntsville-Madison County Chamber of Commerce and a member of the Women's Business Council. She holds degrees from Vanderbilt University in Nashville, Tenn., as well as from the Massachusetts Institute of Technology and Harvard University, both in Cambridge, Mass.

Attendees will learn first hand what technologies and contract opportunities are available from NASA.

Briefings will focus on Small Business Innovation Research/Small Business Technology Transfer programs, Commercialization Assistance, Technology Partnerships and Marshall procurement processes.

The conference will feature exhibits staffed by representatives of the Small Business Administration, the Southeast Region Technology Transfer Center, the Northeast Alabama Small Business Development Center, the Chamber of Commerce Huntsville/Madison County Small Business Office and Women's Business Council, the North Alabama African American Chamber of Commerce, Oakwood College Business & Technology Complex, Alabama A&M University Center for Entrepreneurship, and the Biz Tech small business incubator.

The briefing is a part of the NASA Minority- and Woman-Owned Business National Initiative.

The initiative allows companies to work with NASA to facilitate the transfer of NASA technologies, expertise and resources to the private sector, enabling companies to improve or expand existing products or services.

The writer, employed by ASRI, supports the Media Relations Department.

Marshall completes third successful test

NASA's 2nd Gen RLV Program advances propulsion technology with successful test series

by Marianne Higgins

NASA's Second Generation Reusable Launch Vehicle (RLV) Program — also known as the Space Launch Initiative — is making advances in propulsion technology with this third and final successful engine hot-fire designed to test electro-mechanical actuators.

Information learned from this hot-fire test series about new electro-mechanical actuator technology — which controls the flow of propellants in rocket engines — could provide key advancements for the propulsion systems of future spacecraft.

The test of twin Linear Aerospike XRS-2200 engines, originally built for the X-33 program, was performed Tuesday at Stennis Space Center, Miss. The engines were fired for the planned 90-seconds and reached a planned maximum power of 85 percent.

The test was originally slated to attain full-power during 100-seconds of testing. Prior to the test, engineers determined the necessary results could be achieved at reduced duration and power. Based on this determination, both planned duration and planned power were reduced.

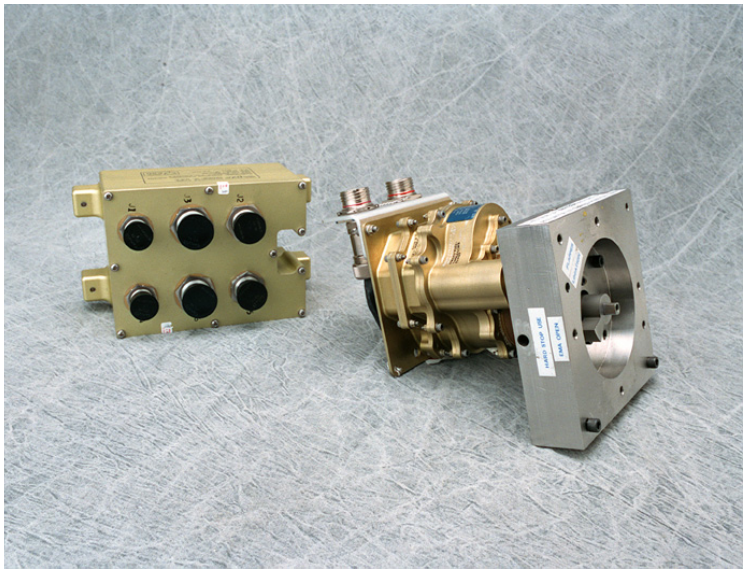
Two shorter hot-fires of the aerospike engines were performed last month in preparation for the final test firing.

The Second Generation Reusable Launch Vehicle Program, led by the Marshall Center is a technology development program designed to increase safety and reliability while reducing costs for space travel.

"Because every engine proposed by industry for a second generation vehicle has electro-mechanical actuators, we took advantage of these aerospike engines already on the test stand to explore this relatively new technology now — saving us valuable time later," said Garry Lyles, Propulsion Projects Office manager of the Second Generation Reusable Launch Vehicle Program at the Marshall Center. "This data is critical toward developing the confidence required to support the use of these actuators on future launch vehicles."

Electro-mechanical actuators electronically regulate the amount of propellant (fuel and oxidizer) flow in the engine. The new technology is a potential alternative and improvement to the older pneumatic and hydraulic-fluid systems currently used by the aerospace industry to drive and control critical rocket engine valves.

"This series of engine firings tested the actuator control system in what we call a 'real condition of use' environment," said Dr. Donald Chenevert, electro-mechanical actuator project manager at the Stennis Center. "Firing allows us to see how the integrated system handles the extreme cold of cryogenic propellants, the stress loads of the propellants pushing through the valves, and the dynamic response to commanded flow rate changes. Additionally, we have many other unique conditions such as shock and vibration loads not found in a lab, so we capture more realistic data about the true performance of the actuators."



Electro-mechanical actuator, right, shown with control box.

Engineers are performing engine post-test inspections, and early indications are that all test objectives have been met, Chenevert said.

The final data is to be fed directly into the engine systems being considered for a second generation reusable launch vehicle, Lyles said.

"Propulsion is one of the highest and most critical technology areas that we are exploring," said Dennis Smith, manager of the Second Generation Reusable Launch Vehicle Program Office at the Marshall Center. "Our goal also is to find, improve or develop technologies such as airframes, avionics, health management systems and ground operations — all to make getting people and payloads into space safer and cheaper."

The Rocketdyne Propulsion and Power Unit of The Boeing Company in Canoga Park, Calif., developed the aerospike engine and supported the engine tests at Stennis Space Center.

Additional information on NASA's Second Generation Reusable Launch Vehicle Program is available on the Internet at: *http://www.slinews.com*

The writer, employed by ASRI, supports the Media Relations Department.

Actuators show promise for 2nd gen RLV propulsion system

by Marianne Higgins

New electronics technology is proving to be advantageous for the main propulsion system planned for a second generation reusable launch vehicle.

The technology is the electro-mechanical actuator — an electronic system that provides the force needed to move valves which control the flow of propellant to the engine.

Hydraulic actuators have been used successfully in rocket propulsion systems. However, when high pressure is exerted on such a fluid-filled hydraulic system, it can leak.

"Electro-mechanical actuators are proving to be low maintenance, which can translate into savings of time and money," said Charlie Nola, integrated vehicle health management and avionics subsystem manager for the Propulsion Projects Office of the Second Generation Reusable Launch Vehicle Program at the Marshall Center.

"The electronic controller is a separate unit powering the actuator. Each actuator has its own control box. So, if we detect a problem in a controller, we simply replace that one unit," said Nola. "The control boxes are located in an easy-to-reach area, so maintenance becomes a simple step performed without dismantling the propulsion system or replacing the actuator."

By comparison, hydraulic systems require significant maintenance and support equipment. If a leak occurs, technicians must dismantle a significant amount of hardware to find and fix the leak, as well as clean up the spill and check the remaining fluid for possible contaminants that could hinder performance.

Hydraulic systems also must sustain significant hydraulic pressures — typically in the range of 3,000 to 6,000 pounds per square inch (210.9 to 421.8 kilograms per square centimeter) in rocket engines — regardless of demand. Electro-mechanical actuators utilize power only when needed.

"The electronic actuator system also weighs less than a hydraulic system," said Nola. "When designing propulsion systems to leave Earth's gravity, anytime you can save weight you're also saving money."

The Second Generation Reusable Launch Vehicle Program goal is to substantially improve safety and reliability while reducing the high cost of space travel from today's $10,000 per payload pound to $1,000 per pound. Efforts are under way at every NASA Center to improve and develop all the technologies required for future spacecraft.

A series of tests was recently performed on a set of linear aerospike engines at Stennis Space Center, Miss., to gather more data about electro-mechanical actuators. Additional information about those tests, and about the Second Generation Reusable Launch Vehicle Program, is available on the Internet at: *http://www.slinews.com*

The writer, employed by ASRI, supports the Media Relations Department.

Safety Bowl 2001

The first round of competition in Marshall's Safety Bowl 2001 is Sept. 12. Are you ready? To help you prepare, review the following questions. More questions appear on the "Inside Marshall" Web site.

1. According to NASA's Occupational Health Program, what are the greatest threats to safety that NASA faces?

2. What should you do if you are in your car and see a tornado approaching?

3. What is the highest level of VPP certification that OSHA will award?
   A. Platinum
   B. Silver
   C. Gold
   D. Star

4. It takes at least how many seconds of scrubbing with soap and water to remove the germs from your hands?

5. According to Alabama boating laws, all persons under what age must wear a U.S.C.G. approved personal floatation device when on any vessel on the Alabama waterways (except when below decks or in a cabin)?

6. The VPP application must contain the endorsements of:
   A. Center Director
   B. Union representatives
   C. Both of the above

7. True or False: During the VPP onsite review, OSHA will audit the Preventive Maintenance Program for equipment at the Center.

8. The number of repetitive motion injuries has risen dramatically in recent years, accounting for about 60 percent of all occupational illnesses. What is the most frequently reported cumulative trauma disorder?

9. True or False: During the OSHA VPP onsite review, OSHA will not ask employees to explain the disciplinary program for violations of safety rules and standards.

10. True or False: OSHA will be looking for a written requirement to perform emergency drills at least annually, as well as documentation that the drills are conducted, when they conduct the VPP onsite review.

*See **Answers** on page 12*

NASA selects two design tools as Software of Year

Marshall Center engineer leads local development team

NASA release

Computer programs that reduce aircraft engine analysis time and improve the study of fluid dynamics in rocket engines have been selected as NASA's 2001 software of the year winners.

The Generalized Fluid System Simulation Program (GFSSP) is a general purpose computer program for analyzing fluid-flow rate, pressure, temperature and concentration in rocket engines, turbo pumps and fuel tanks.

The program is capable of modeling liquid fuel phase changes including compressibility, mixture thermodynamics and the effects of external influences, such as gravity and centrifugal force.

Alok Kumar Majumdar of the Marshall Center, led the development team, which included engineers from Marshall; ERC Inc.; and Sverdrup Technology, also of Huntsville.

The development of the GFSSP software eliminates the need to develop specific-purpose software. Cost savings also can be realized through reducing hardware testing and continuous improvement. It is estimated that one organization's use of GFSSP can save between $825,000 and $1.5 million.

The Numerical Propulsion System Simulation (NPSS) software — developed at the Glenn Research Center in Cleveland — allows multi-fidelity analysis in designing aircraft engines, offering key technological advances to increasing the U.S. aerospace industry's competitiveness. The General Electric Aircraft Engines Co. estimates a 55 percent reduction in engine analysis time using this new software.

Cynthia Gutierrez Naiman of Glenn Research Center led the development team that included 39 other engineers from Glenn; Arnold Engineering Development, Arnold Air Force Base, Tenn.; Dynacs, Cleveland; General Electric Aircraft Engines Co., Cincinnati; GESS, Cleveland; Honeywell, Tucson, Ariz.; Pratt & Whitney, East Hartford, Conn.; Modern Technologies Corp., Middleburg Heights, Ohio; Rolls Royce Corp., Indianapolis; RS Information Systems Inc., Cleveland; and The Boeing Company, Seattle.

Mail Services offers tips

from Logistics Services

To better meet customer needs and further improve mail services, Logistics Services is providing the following information to help Marshall employees and contractors understand the mail delivery process and the process to be used when personnel move at the Center.

The contractor, Cortez III, conducts Center Mail Services Operations. It receives, sorts, meters/stamps and distributes all types of mail. The volume of Marshall mail operations is about 221 tons of mail annually — or 212 pounds of mail per hour.

When mail is received at Marshall, it is sorted and delivered by "organization codes." Employee organization codes are like home addresses. If an employee(s) changes organizations, mail services must be made aware of the new code or the mail will be routed incorrectly.

Logistics Services is implementing a new process in mail service, tailored from the U.S. Postal Service, to ensure that when employees move, the mail delivery process continues to be timely and accurate.

Employees changing organization codes and/or building locations should fill out an MSFC FORM 4309 and mail it to AD42M. MSFC FORM 4309 will be provided to employees scheduled to move, or is available in the Electronic Form System at: *http://starbase.msfc.nasa.gov:8000/forms/forms.taf.*

The form will be used to redirect mail to an employee's new location. Marshall employees and contractors should notify internal associates, external associates and magazine venders of organizational code changes. Mail operations will manually reroute mail for two months to allow an employee time to notify internal and external associates.

For more information, call 544-8117 or 544-6006.

Retirees Association history book deadline extended

The NASA-Marshall Center Retirees Association is planning to produce a history book on the rockets and spacecraft developed by the Marshall Center team during the past 50 years. The deadline — originally July 30 — has been extended through September.

"The book will be produced as a collector's edition," said Ed Buckbee, president of the Retirees Association. "It will include a comprehensive accounting of those technology advancements and famous space achievements made possible by the Marshall and Redstone employees who helped our nation become the world's leader in space exploration."

Submit stories, photographs and orders for the book — at $34.95 each — to Turner Publishing Company, ATTN: NASA-Marshall SFC Retirees Book, 412 Broadway, P.O. Box 3101, Paducah, Ky. 42002-3101. All submitted material will be returned to its owner after the book is completed.

NASAexplores makes a difference on Web, in classroom

Marshall release

So, you think the only connection between astronauts and golfing was that famous Moon-shot taken by Alan Shepard on the Apollo 14.

Or, maybe your only knowledge of LEDs — light-emitting diodes — is the beam coming from the alarm clock on your nightstand. If that's the case, it's time to check out NASAexplores — NASA's new teacher resource on the Web.

NASAexplores offers two articles — based on NASA research, developments and events — and corresponding lessons each week for kindergarten through 12th grade teachers. Content on the site is developed and maintained by a team at the Marshall Center.

Since the Web site was unveiled by the Marshall Center last January, more than 60 education-based Web sites and 12 Internet search engines have added hyperlinks to NASAexplores, increasing traffic to the site by a whopping 240 percent.

The project is supported by NASA's Aerospace Technology Enterprise and Human Exploration and Development of Space Enterprise.

The new site is listed on internationally recognized Web search engines and directories such as Yahoo!, America Online, Open Directory Project and Google. Other Web sites and portals — such as the National Education Association, CNNfyi.com and Cosmiverse — also have added information and easy-access direct links.

"The increased traffic to our site is exciting," said Jim Pruitt, manager of Marshall's Education Programs Department. "Thanks to these links, NASAexplores is reaching teachers worldwide. NASA's future success will, in part, depend on the quality of its future workforce — today's students. Our mission is to generate awareness of — and build students' interest in — technology, science and mathematics."

Boosted by the Internet exposure, the site is reaching students across the nation, according to teacher Mark Schober of Johns Burroughs School in St. Louis, Mo. "It's one of the most useful NASA pages I've employed in the classroom," said Schober, who's using NASAexplores in his high school science classes.

Melvina Phillips, principal at Discovery Middle School of Madison, Ala., touts NASAexplores as "absolutely fabulous — easy to use, everything is right at my fingertips."

NASAexplores lessons are easy for educators to retrieve, prepare and use, and meet national educational standards.

Even though the program is designed with teachers and students in mind, Pruitt says NASAexplores is fast becoming popular with the public as well.

Individuals can easily access the site at: *http://www.nasaexplores.com*

Or, they can sign up on a subscriber list to receive weekly e-mail notices linking them directly to the Web site. These content alerts give educators an abstract of each article, as well as objectives for each lesson for each grade level.

"This site supplements textbooks with the latest discoveries about our universe," says Pruitt.

As administrators and educators learn of NASAexplores, more state education associations and individual school districts are adding links from their home pages to the Web site.

For more information about NASA's commitment to education, visit: *http://education.nasa.gov*

Saucier

Continued from page 1

planning and analyses as Marshall worked to define advanced space transportation and exploration systems.

In 1980, Saucier was named deputy manager of the Inertial Upper Stage Project, and was appointed manager in 1982 with added responsibility of the Transfer Orbit Stage Project. In 1986, he became deputy manager of the Science and Applications Projects Office, and was named its manager in 1987, with responsibilities for the Inertial Upper Stage, the Automated Rendezvous and Capture Project, the Earth and Space Sciences Projects, the Microgravity Research Projects and the Global Hydrology and Climate Center. Saucier was appointed director of the Propulsion Laboratory in 1996.

His special honors and awards included NASA's Distinguished Service Medal, Presidential Rank of Meritorious Executive, two NASA Exceptional Service Medals, the Space Flight Awareness Leadership Award and many NASA Group Achievement Awards.

Active in professional and civic work, Saucier was an elected member of the Huntsville City Council from 1972-76. He was past chairman of the Huntsville-Madison County Airport Authority board of directors, and past president of the Marshall Association.

Saucier, a native of Vicksburg, Miss., received a bachelor's degree in chemical engineering from Mississippi State University in Starkville, Miss., and also attended the University of Alabama in Huntsville.

He is survived by his wife, Gloria Carr, two daughters, one son and five grandchildren. In lieu of flowers, the family asks that memorial donations be made to one of the following: Robin Stewart Memorial Fund, c/o Comprehensive Cancer Institute, 201 Sivley Road, Huntsville, AL 35811; Greater Huntsville Humane Society, 2812-A Johnson Road, Huntsville, AL 35805; or Catholic Family Services, 1010 Church St., Huntsville, 35801.

Job Opportunities

CPP-01-082-CP, Supv., AST Technical Resources Management, GS-801-15, Office of Chief Financial Officer, R&D Analysis Office. Closes Aug. 10.

CPP-01-050-DS, AST, Experimental Facilities Development, GS-801-14, Center Operations Directorate, Facilities Engineering Dept., Planning and Integration Group. Closes Aug. 10.

CPP-01-068-GF, AST, Technical Resources Management, GS-801-14, Engineering Directorate, Structures, Mechanics and Thermal Dept. Closes Aug. 13.

CPP-01-040-CP, Budget Analyst, GS-560-12, Office of the Chief Financial Officer, Institution/Integration Office. Closes Aug. 14.

CPP-01-073-JB, AST, Liquid Propulsion Systems, GS-861-14, Space Transportation Directorate, Subsystem and Component Development Department, Functional Design Group. Closes Aug. 14.

CPP-01-078-JB, AST, Aerospace Vehicle Propulsion Systems, GS-861-14, Space Transportation Directorate, Vehicle and Systems Development Department, Systems Analysis Group. Closes Aug. 14.

CPP-01-075-JB, AST, Liquid Propulsion Systems, GS-861-14, Space Transportation Directorate, Vehicle and Systems Development Department, Control Systems Group. Closes Aug. 14.

CPP-01-061-JB, AST, Project Management, GS-801-15, Space Transportation Directorate, Second Generation RLV Program. Closes Aug. 15.

CPP-01-071-EB, Supv., AST, Electronic Instrumentation Systems, GS-855-15, Engineering Directorate, Avionics Dept., EEE Parts and Packaging Group, Closes Aug. 15.

CPP-01-070-CL, Supv., AST, Aerospace Flight Systems, GS-861-15, Engineering Directorate, Engineering Systems Dept., Systems Engineering Support Group. Closes Aug. 15.

CPP-01-077-CL, Supv. AST, Mission Operations Integration, GS-801-15, Flight Projects Directorate, Payload Operations and Integration Dept., Operations Development Group. Closes Aug. 15.

CPP-01-076-JB, AST, Electronic Instrumentation Systems, GS-855-14, Space Transportation Directorate, Test and Evaluation Dept., Measurement Group. Closes Aug. 17.

CPP-01-069-CL, AST, Mission Operations Integration, GS-801-14, Flight Projects Directorate, Payload Operations and Integration Dept., Payload Operations Directors Group. Closes Aug. 17.

CPP-01-072-JB, AST, Flight Systems Test, GS-861-14, Space Transportation Directorate, Test and Evaluation Dept., Mechanical Group. Closes Aug. 17.

CPP-01-074-JB, AST, Electronic Instrumentation Systems, GS-855-14, Space Transportation Directorate, Test and Evaluation Dept., Control Group. Closes Aug. 17.

Reassignment Bulletin, 01-013-GF, Supervisory, AST, Structural Mechanics, GS-861-14. Engineering Directorate, Strength Analysis Group, Structures, Mechanical and Thermal Dept. Closes Aug. 16.

Aggressive drivers, who are they?

from Marshall's Safety Office

Here's what we know about aggressive drivers: These high-risk drivers climb into the anonymity of an automobile and take out their frustrations on anybody at any time.

For them, frustration levels are high, and level of concern for fellow motorists is low. They run stop signs and red lights, speed, tailgate, weave in and out of traffic, pass on the right, make improper and unsafe lane changes, make hand and facial gestures, scream, honk and flash their lights. They follow too closely, change lanes frequently and abruptly without notice — signals, pass on the shoulder or unpaved portions of the roadway, and leer at and/or threaten — verbally or through gestures — motorists who are thoughtless enough to be in front of them.

When confronted by aggressive drivers:

• First and foremost: make every attempt to get out of their way. **Put your pride in the back seat.** Do not challenge them by speeding up or attempting to hold-your-own in your travel lane.

• **Wear your seat belt.** It will hold you in your seat behind the wheel in case you need to make an abrupt driving maneuver and it will protect you in a crash.

• **Avoid eye contact.**

• **Ignore gestures** and refuse to return them.

• **Report aggressive drivers** to the appropriate authorities by providing a vehicle description, license number, location, and, if possible, direction of travel.

• If you have a cellular phone, and can do it safely, you can report aggressive or impaired drivers to the police by calling # 77.

• If an aggressive driver is involved in a crash farther down the road, stop a safe distance from the crash scene, wait for the police to arrive, and report the driving behavior you witnessed.

Avoid the challenges or confrontations of an aggressive driver and support law enforcement's efforts to rid the streets and highways of this menace.

Obituaries

Ayers, Verda R., 81, of Grant, died June 20. She retired from Marshall in 1976 where she worked as a clerk typist.

Crockett, Charles D. 76, of Huntsville, died July 17. He retired from Marshall in 1995 where he worked as an aerospace engineer. He is survived by his wife, Vivian Crockett.

Newman, Dewey F., 92, of Chattanooga, died July 17. He retired from Marshall in 1980 where he worked as a physical science technician. He is survived by his wife, Helen Newman.

Birdwell, Frances L., 81, of Athens, died July 19. She retired from Marshall in 1977 where she worked as a clerical assistant.

10 a.m.-3 p.m. Aug. 25

Exhibits make Family Fun Day a learning experience

Not everyone enjoys midway games and carnival fun, but they may enjoy browsing through exhibits. Marshall's Family Fun Day — from 10 a.m.-3 p.m. Aug. 25 — will have something for everyone.

Marshall's newest traveling exhibit — Starship 2040 — will show visitors what the future of spaceflight could be like. For guests with a more whimsical liking, there is a Butterfly on Parade exhibit. And there will be car, motorcycle and airplane shows featuring vintage and specialty vehicles.

Starship 2040

The Starship 2040 traveling exhibit will be on-hand to inform visitors of all ages about possible future technologies and commercial opportunities in space. Housed in a 48-foot trailer, the exhibit lets visitors walk through a mock-up of the spacecraft's control, passenger and engineering compartments, gaining insight into the technologies that eventually will make such an out-of-this world experience as routine as air travel. More information about Starship 2040 can be found on the Web at: *http://www.starship2040.com/*

Like butterflies?

Check out Marshall's Butterfly on Parade.

Andrea Ise, an artist in the Information Services Department in Center Operations Directorate, designed the Marshall butterfly with the help of Charles Cowen, engineering technician and Linda Brewster, team lead, both with the Flight Robotics Laboratory, and Fred Roe, branch chief of the Orbital Simulations Group in the Engineering Directorate.

The butterfly is made mostly with recycled materials used and created here at the Marshall Center.

Two Marshall retirees, Bill Huber and Bill Snoddy, sponsored a butterfly and wanted a Marshall Center artist to design and make the butterfly.

The butterfly will be on display in the Bldg. 4200 complex after Family Fun Day until next April where it will then be moved to the Huntsville Botanical Gardens for the opening of the 2002 Butterfly House.

Butterflies on Parade is the name of the fund-raiser that the Botanical Gardens started two years ago to raise money for its Butterfly House. Various individuals and businesses have purchased these butterfly sculptures from the Botanical Gardens and painted/decorated them with different and unusual themes. The butterflies are then displayed throughout the Botanical Gardens.

Car and motorcycle show

Anyone who has a special interest, vintage or antique car, truck or motorcycle has a chance to show off his or her "baby."

Entries in the show will be taken until 9 a.m. on the day of the show. Anyone who plans to enter should contact Lou Nosenzo by e-mail or call 544-7401 to pre-register. Nearly any kind of vehicle from Model T's to current day vehicles to racecars and/or carts can be entered.

A unique dash plaque logo has been designed especially for this year's show and all participants will receive one mounted on a wooden plaque with a picture of their car. Spectator voting will determine first through third place entries with special awards given in addition to the plaques.

If you don't have a vehicle you wish to enter, but want to be involved, the committee is looking for volunteers to work one-hour shifts during the show. Call 544-7401.

Airplane show

Private airplanes and military hardware will be on display at this year's Family Fun Day picnic. Come by and visit them at the north side of Bldg. 4752. If you have an antique, experimental or a special airplane you would like to display, send an e-mail to Paul Johnson as soon as possible.

The Redstone Arsenal Army Air Field requires prior permission before you can land at the airport. This is a simple process by just filling out forms. However, this must be done in the next couple weeks if you are planning to participate.

As with prior picnics, you will need to land at the airport by 7 a.m. Security and street sweeper escorts will take all the airplanes to the picnic area down Rideout Road to Martin Road. Street signs will be checked for wing clearances.

Space is limited and it will be first-come, first-serve.

More information on Family Fun Day is available on the Web at: *http://picnic.msfc.nasa.gov*

AIAA presents awards to five Marshall employees during annual installation and awards dinner

Five members of the Marshall team received awards at the Association of Aeronautic and Astronautics' 49th annual installation and awards dinner recently at the Von Braun Center.

Koelfgen

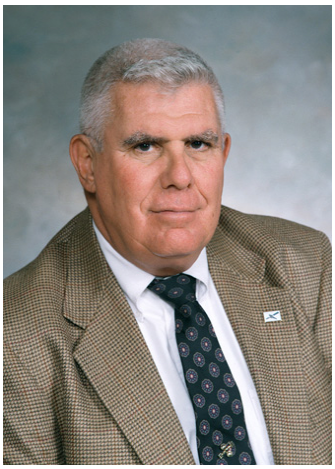
Syri Jo Koelfgen, a Graduate Student Research Program fellow at the University of Alabama in Huntsville, received the AIAA Foundation John Leland Atwood Graduate Award.

Melissa K. Vandyke, an aerospace engineer in the Propulsion Research Center, was named the 2000-2001 Aerospace Engineer of the Year. The award recognizes an individual who has demonstrated extraordinary technical skill and leadership in aerospace engineering.

Vandyke

Vandyke is project manager for Marshall's Safe Affordable Fission Engine test series. The program is working to develop a safe, affordable, high performance space fission propulsion system.

Robert L. Sackheim, Marshall's assistant director and chief engineer for space propulsion, received the Martin Schilling Award. This award — sponsored by Teledyne Brown Engineering, is presented to a member of the Alabama-Mississippi Section of the AIAA to recognize outstanding service to the Section, such as major contributions to its growth, technical programs or administrative functions.



Sackheim

Sackheim made significant contributions to the Section through his leadership, as a spokesman for Section activities and as a contact to leaders in the aerospace community.

★ ★ ★
Marshall Stars
★ ★ ★

This was demonstrated with his organization of the Section's first Systems Engineering Seminar.

Miria M. Finckenor of Marshall's Engineering Directorate was named Young Aerospace Engineer of the Year. She works on basic properties of materials in Marshall's Engineering Directorate's Materials Processes and Manufacturing Department.

Finckenor

Known nationwide for her work in space environmental effects, Finckenor is working on the Materials on International Space Station Experiment (MISSE) launched on STS-104 last month. This is the first external experiment to be conducted on the Space Station.

The Young Aerospace Engineer of the Year Award recognizes an individual up to 35 years old who has demonstrated extraordinary technical skill and dedication in aerospace engineering.

Dr. Martin Weisskopf, project scientist for the Chandra X-ray Observatory, received the Hermann Oberth Award. This award — sponsored by the Lockheed-Martin Corp. — is for outstanding individual scientific achievement in astronautics and space sciences, or for the promotion and advancement of the aeronautical sciences. It is presented annually to a member of the Alabama-Mississippi Section.

Weisskopf

Protect Your Privacy

You have probably recently received privacy policies from your financial institutions, as required by the Gramm-Leach-Bliley Act. What you may not know is that you have the right to opt out of having your personal information released to third parties. The three major U.S. credit bureaus, Equifax, Experian and Trans Union, have provided a toll free number where individuals may opt out of having their personal information released by these companies. You may opt out by calling 1-888-5-OPTOUT (1-888-567-8688). You may opt out for everyone in your household with a single call. For more information about this and other ways to safeguard your privacy, such as removing your name from marketing lists, visit the Federal Trade Commission's Web site at: *http://www.ftc.gov/privacy/protect.htm*

Spot bid sale

The Disposal Operations at Marshall will be conducting a drop-by spot bid sale from 9 a.m.-2 p.m. Aug. 16 at the Intergraph Bldg. No. 21 at 470 Dunlop Blvd. in Huntsville. For sale will be 10 laptop computers, 17 computer systems and 58 lots of assorted furniture. For more information, call 544-1774.

Upcoming Classes

Russian culture

The Russian Culture for Communication course has been rescheduled to Aug. 27-31, from 8 a.m.-noon daily at the University of Alabama in Huntsville, Wilson Hall, room 118. Anyone who interacts with Russian people, here or abroad, will benefit from attending this course. Civil servants may enroll via AdminSTAR, or send an email to Laura.Groce@msfc.nasa.gov. The deadline for registration is Aug. 17.

Clubs and Meetings

NARFE meets

Mary Lou Kraatz, executive director of the North Alabama chapter of the Alzheimer Association will present an overview of the chapter, its history, services available and how to contact the chapter at The National Association of Retired Federal Employees (NARFE) meeting at 9:30 a.m. Saturday at the Senior Center on Drake Avenue. For more information, call 881-4944 or 881-3168.

Association scholarships

The Marshall Association is accepting applications for college/university scholarships through Aug. 24. Two scholarships — one technical, one non-technical — will be awarded to incoming freshmen in September 2001. For more information, call Efrem Hanson at 544-6340.

Facilities Office breakfast

Facilities Office retirees will meet for breakfast at 8 a.m. Aug. 14 at the Shoney's on University Drive and Memorial Parkway. For more information, call Carl Gates at 232-2950.

Genealogy society meets

The Huntsville Genealogical Computing Society will meet at 7 p.m. Aug. 20 in the auditorium of the Huntsville-Madison County Public Library. The program is on researching genealogy online and using family archive CDs.

Sports

Women's tennis

The MARS Tennis Club is holding an Open Women's Doubles Tournament Saturday. Warm-up begins at 8 a.m. and play begins at 8:30 a.m. The guest fee is $3 for this tournament, and at least one member of the team must be a member of the MARS Tennis Club. To participate, send an e-mail to Amy Hemken or call 544-7097.

Bowling league

The MARS Bowling League will hold an organizational meeting at 6 p.m. Aug. 21 at Monarch Lanes at 2009 Bob Wallace Ave. in Huntsville. Team captains or a member of each team should attend. The league will begin at 6 p.m. Sept. 4. Marshall employees, retirees, contractors and family members may join. For more information, call Chuck Seal at 544-1120 or Rob Lake at 544-1176.

Miscellaneous

Get paid to quit smoking

Smokers can sign up before Sept. 30 and get paid to participate in a research study to evaluate a stop-smoking program on the Internet. All Marshall employees, spouses and family members 18 and older are eligible. Go to www.quitcigs.org. The program was developed by the Oregon Center for Applied Science, funded by the National Cancer Society.

Dance lessons

Dance lessons will resume in September. Fox Trot and Tango lessons will be taught the first four Mondays after the Labor Day weekend — Sept. 10, 17, 24, and Oct. 1 — at Saint Stephens Episcopal Church on Whitesburg Drive, second building north of Lily Flagg Road. Intermediate lessons will be from 7-8 p.m., and beginners from 8-9 p.m. Rick Jones of the Rocket City Dance Studio since 1993, and certified by the National Dance Council of America, will be the instructor. Cost is $6 per person per class. For more information, call Woody Bombara at 650-0200.

Employee Ads

Miscellaneous

★ Camper shell, red, color matches and fits some S-10 Chevy and Ford Ranger trucks, $300. 882-2400
★ Radio Shack XTX-245, dual band amateur transceiver, 2-meter/440, CTCSS, DTMF, $130. 772-9168
★ Dresser w/mirror, $125; rocking chair, $45; Kenwood 5-way stereo speakers, $100 ea.; green chair & matching ottoman, $225. 881-8674
★ "Clouds" dorm-size, extra-long bedspread and sheets, used one semester, $40. 233-4574
★ Snap-on professional size heavy-duty toolbox, 16 drawers, $1,800. 858-5552
★ Mitsubishi CS-36309 stereo/TV w/ADV PIP, 36", $800 obo. 205-647-4949
★ Troybuilt tiller, new engine, 7HP, electric start, $750; Sears table saw, 10", $100. 256-852-2044
★ Old Town canoe, camper model, red, plus accessories, $600. 837-7916
★ 1988 Honda 300 ATV, 4-wheeler, $2,000. 651-6598
★ Two 1992 Polaris 650 jet skis and double trailer, both run but need minor work, $2,900. 961-1093
★ 1980 Harley Davidson Sportster, black, 22K miles, $5,000. 859-4663
★ Four Goodyear Eagle GPS P205/55 R15 performance tires, new, never used, $450 obo. 859-6952/leave message
★ Two wood jungle gyms, $35; electric lawnmower, 18", $99; Sunbeam gas grill w/o bottle, $52. 881-6040
★ Antique round clawfoot oak dining room table w/ 4 fancy spindle back cane-bottom chairs, $800 obo. 353-0370 after 5 p.m./leave msg.
★ Washer, $80; dryer, $90; refrigerator, 14 cu. ft., frost free, $130. 837-6649
★ Storm windows, white vinyl replacement, two 44-3/8x47; one 43-1/4x47-1/8, $125 obo. 881-5842
★ Wood clarinet, $400. 527-7090/880-9594 after 4 p.m.
★ 1976 Alacraft 15' runabout w/trailer, 50HP Mercury motor, boathouse kept, $1,500 obo. 256-582-5210
★ 1997 Honda Shadow VLX, 600cc, garage kept, 10K miles, MSTA, $3,200 obo. 746-9080
★ Ethan Allen maple double pedestal desk w/ shelves, $1,400; Georgian Court triple dresser w/ mirror, $1,800. 852-2936
★ Pentium II 200Mhz computer system w/32Mb Ram, 3GbHD, 17" Trinitron monitor, $250 obo; 5-drawer file cabinet, $35. 882-1779
★ RC aircraft & equipment; Concept 30 helicopters, Christen Eagle, Cessna, Decathalon models, 72 MHZ transmitters. 603-7898
★ Go-cart, two seats, 5HP, $425. 859-4833
★ High Country Supreme bow, 60 lb./27" draw, dozen broadheads, case, more, $300. 534-4841
★ Brunswick pool table, l yr. old, paragon oak w/ cherry finish, navy blue felt, 1" slate, drop leather pockets, $2,000. 509-3392
★ 1992 Bullet 20XRD, 1994 260HP Mercury, tandem axle, trailer w/brakes, $12,900. 431-2650
★ Bass boat, 16', 85HP Johnson, new seats and carpet, live-well, trolling motor, depth-finder, $1,500. 961-1136/205-429-3805

Vehicles

★ 1997 Saturn SL, gray, 4-door, 5-speed, power steering, AM/FM cassette, 123K miles, $4,000 obo. 256-551-0276
★ 2000 Grand Cherokee Jeep, 18K miles, leather, sun-roof, AM/FM cassette/CD w/10-disk changer, buy-out/assume lease. 337-0201
★ 1972 Chevy LWB pickup truck, 6 cyl., 3-speed, new tires & battery, good body, AM/FM/CD, $1,000 obo. 882-0461
★ 1978 Chevy 1/2-ton pickup, 350 engine, Trailering Special suspension & auto trans., $650. 778-9149
★ 2000 Chevy Impala, AM/FM/CD, ps, midnight blue, 19K miles, $15,999. 864-2629
★ 1996 Nissan Pathfinder LE, 2WD, auto, green, gray leather, 71K miles, $13,500 obo. 232-1940
★ 1989 Jeep Cherokee, Pioneer model, red, 4-door, 4WD, a/c, 144K miles, $4,000. 539-5886
★ 1989 Cadillac DeVille sedan, 4-door, V-8, automatic, burgundy, leather power seats, ABS, 104K miles, $4,500. 895-8306
★ 1996 Mazda Miata, tan leather, Montego blue, 26K miles, power windows, AM/FM/cassette/CD, 5-speed, $11,000. 533-3107
★ 1978 Silver Anniversary Corvette Special Edition, w/35+ show trophies, 40K actual miles, $13,995. 883-5955
★ 1996 Millenia, dark green w/tan leather, power sunroof, 62K miles, heated seats, $11,500. 880-9025
★ 2000 Intrepid, many extras, new custom 17" rims/tires, extended warranty, 45K miles, serious inquires only. 615-423-2837
★ 1998 Subaru Outback Limited, auto, full-power, leather, new tires, $14,750. 256-753-2700
★ 1978 Camaro Z28, black 350, 40K miles, $5,000 obo. 880-2859/653-8302
★ 1987 Volvo GLE wagon, 187K miles, $1,350 obo. 882-3900
★ 1969 Camaro, new 400 SB by Mitchell racing engines, 4-speed Muncie, 3.73 rear end, needs paint & upholstery, $9,000 obo. 509-3392
★ 1992 Buick Roadmaster, blue, PS/PB/PW, A/C, Am/FM cassette/radio, 150K miles. 379-2159
★ 1998 Nissan Frontier, 4x4, manual 45K miles, alloy wheels, new tires, $10,500 obo. 931-438-7947/256-920-4222

Wanted

★ Portable wire cage/crate for medium to X-large dog; doorway gate for toddler pet. 883-2063
★ Panoply posters 1982-1987, 1991. 533-2935
★ Kitchen sink, almond color, nominally 21"x33". 881-6040
★ Loft bed for youth. 837-1569
★ Free car or very low monthly payments; desperately need dependable vehicle. 721-7835

Found

★ One ladies earring, Bldg. 4200 parking lot on 7/31/01. Call 544-4758 to claim/identify

Answers

Continued from page 5

1. Undetected and unrecognized errors caused by a compromised physical and mental state
2. Get out of the car and lie flat in a ditch or low-lying area away from the vehicle.
3. D.
4. 15 seconds
5. 8 years old
6. C.
7. True
8. Carpal Tunnel Syndrome
9. False
10. True

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